Survey Analysis of Texas Peace Officer's Crash Report Form (CR-3)
(Revision 1-1-2010)

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Executive Summary

Survey Analysis of Texas Peace Officer's Crash Report Form (CR-3)

Overview

The Texas Department of Transportation (TxDOT) commissioned the Center for Transportation Safety (CTS) at the Texas Transportation Institute (TTI) to conduct two surveys to obtain feedback from law enforcement officers and administrators on the January 2010 version of the Texas Peace Officer's Crash Report (CR-3) Form. Results from both of the surveys, the first conducted in July 2010 and the second in September, 2010 found that using the CR-3 (01-10) form is both confusing and time consuming. Implementation of the new form resulted in a dramatic increase in completion time, inaccurate data collection, and frustrated officers. Analysis of law enforcement users' preferences for crash reporting leads TTI-CTS to recommend a multifaceted approach to address these issues, including:

- A simplified form without the need to reference a code sheet;
- Common CR-3 codes printed directly on the form;
- Expanded data fields for hand-written responses;
- Continued use of third-party vendors for data input;
- User testing of a modified CR-3 form; and
- Maintenance of the current electronic version of the CR-3 form.

Survey Methodology

State law enforcement officers use the CR-3 form (01-10) to report all vehicular crashes in Texas. The form is vital for data gathering, crash reporting, and monitoring crashes in Texas. TxDOT recently revised the form, and contracted with TTI-CTS to survey and analyze feedback from Texas law enforcement agencies concerning the usability of the form and reporting process.

TTI-CTS administered two surveys and participated in user group forums. Researchers found that respondents consistently reported dissatisfaction with the current crash reporting system. Responses from the initial survey in July 2010 suggested that many of the law enforcement users found the new CR-3 form (01-10) to be much more complicated than its predecessor. Users commented that:

- New formatting and reporting processes made crash reporting more difficult;
- New coding requirements created confusion, frustration, and apathy;
- Hand-written responses (script options) were removed in lieu of coding;
- Crash reporting completion time was dramatically increased; and
- Form data field and font sizes were too small to be written in and/or read.

TTI-CTS and TxDOT conducted a series of open law enforcement user forums in seven Texas cities. Responses indicated that those attending had some of the same types of frustrations experienced and reported in the initial survey. These results helped obtain information regarding crash data and collection procedures and contributed to an understanding of how the CR-3 form impacted law enforcement agencies in Texas.

TTI-CTS conducted a second survey in September 2010 specifically focusing on how the new CR-3 form and data collection process impacted law enforcement administrators and their agencies. TTI-CTS contacted 1,800 agencies and received responses from 469 law enforcement administrators. The second survey sought to obtain additional feedback in order to:

- Better understand agency administrators' concerns with the new crash reporting method;
- Understand how each agency was handling the changes in crash reporting to TxDOT; and
- Discover which method of crash reporting administrators preferred, if given a choice.

Previous Attempts to Improve Usability

While law enforcement administrators indicated that the new CR-3 form (01-10) collected the necessary crash information, the structure and ease of use of the new form hindered accurate information recording. Three out of four respondents agreed that the form collected the necessary data, but only 28% felt it was structured well, 14% felt it was easy to use, and 48% felt the form enabled an accurate collection of data.

In an attempt to resolve identified user obstacles, tools were created to ease issues with the transition. The tools included a separate code sheet and a code sheet that was transposed onto a plastic clipboard. The code sheets were to act as a guide for users to follow when inputting information into the form.

While the clipboard and code sheet were designed to provide CR-3 users with the necessary codes to assign information to the data fields, users overwhelmingly reported that they were ineffective at increasing the ease of use or accuracy of inputting data. Only 24% of respondents felt that the code sheet improved ease of use and 27% felt it improved accuracy. Similarly, 35% felt the clipboard improved ease of use, and 35% felt it improved accuracy. However, the majority of users felt inserting the codes directly into the form would improve accuracy (74%) and ease of use (78%).

TTI-CTS researchers also reviewed crash reporting forms used in five states for benchmarking and comparative analysis. While the informational content of other States' forms were virtually identical to Texas, several data collection options were identified that could potentially improve the CR-3 form ease of use and accuracy, including:

- Checkboxes;
- Bubbling; and
- Coding integration

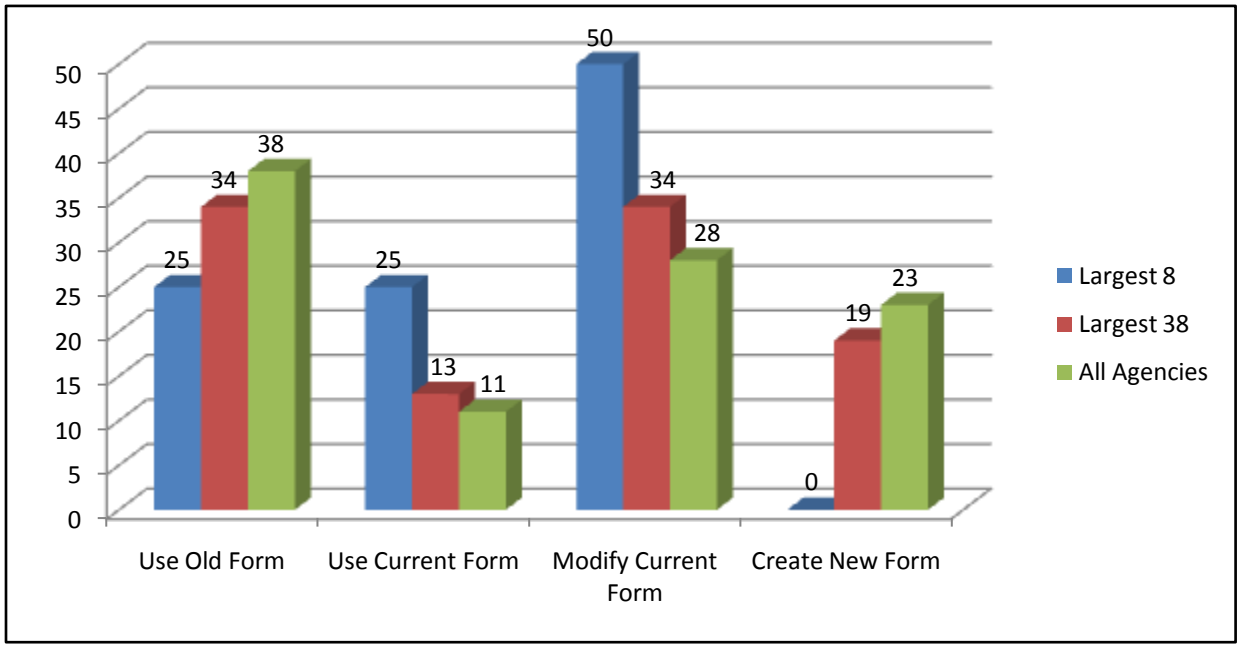
Preferences for Reporting Crashes

Respondents to the September 2010 survey were asked to select one of four options they would prefer for collecting crash data, if given a choice:

- Return to the old CR-3 form (3-09);
- Use the current CR-3 form (01-10) as is;
- Modify the CR-3 form (01-10); or
- Develop a new crash report form.

The following chart illustrates the respective preferences of respondents from the eight largest agencies, the 38 largest agencies, and all agencies.

Crash Reporting Option Preference Choice of Responding Law Enforcement Administrators



Options

The following is a breakdown of the advantages and disadvantages of each reporting preference option presented to the agencies.

Return to Old Version of CR-3 Form (03-09)

Advantages	Disadvantages
No need to consult separate coding sheet to complete data fields	Majority of CR-3 users do not want to return to this older version
Simplicity of use	Delay in automated crash reporting project at TxDOT
Coding noted on the report	---
Fill in the blank format	---
User familiarity	---

Use Current CR-3 Form as is (01-10)

Advantages	Disadvantages
Continued progress toward automatic crash reporting at TxDOT	Statewide user dissatisfaction
Transportation Committee approved method of crash reporting	Form is not easy to complete, resulting in reporting delay
Designed by working group of law enforcement, research and traffic safety stakeholders	High rate of reports being returned for error
---	High rates of user error

Modify the Current CR-3 Form (01-10)

Advantages	Disadvantages
Improves ease of use	Costs for redesign & implementation
Increases data collection accuracy	Need for third-party software changes within some larger law enforcement agencies
Strikes a balance between collectors and users of data	May be unsatisfactory to those wanting to return to the old version of the form.
Allows improvement in process	---
Allows continued progress toward automated crash reporting at TxDOT	---

Create a New Crash Report Form

Advantages	Disadvantages
Usability is primary objective	Most expensive option
New reporting ideas may be explored	CR-3 form would still have to be used while the new form is being developed
Development would not be hindered by preexisting formats	Need for third-party software changes within some larger law enforcement agencies
---	Re-training costs
---	Could lead to Dissatisfaction of CR-3 working group participants

Recommendations

Following analysis of the surveys and comparison of the advantages and disadvantages of the various options, TTI-CTS recommends that a combined approach may be the best way to serve the different needs of all stakeholders. The approach should:

- Develop a modified version of the CR-3 (01-10) crash report;
- Simplify the form for hand-writing so that information can be easily captured in the field without having to refer back to code sheets;
- Add common CR-3 codes directly to the form;
- Expand the form data fields to allow for hand-written responses;
- Continue to use TxDOT data entry vendor to interpret hand-writing into coded responses for data entry purposes for the TxDOT Crash Records Information System (CRIS);
- Leave the Excel and PDF electronic version of the (01-10) CR-3 form unchanged since it is self-correcting and has code choice options available for selection in drop-down box menus; and
- Allow those agencies who wish to continue using the (01-10) CR-3 form as it presently exists to do so while providing a second crash reporting option to those agencies that prefer to use a modified version of the CR-3 form.

Next Steps

- Produce a modified “new” version of the CR-3 crash report form;
- Present the modified “new” CR-3 crash report form to selected law enforcement and TxDOT personnel for review and comment; and
- Finalize the modified “new” CR-3 crash report form for delivery to TxDOT by December 1, 2010 to be considered for placement on the meeting agenda of the January, 2011 Texas Transportation Commission meeting.

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Introduction and Background – First CR-3 Survey

In July 2010, the Texas Transportation Institute (TTI) designed and distributed a survey to obtain feedback from Texas law enforcement agencies regarding user experience with the January 2010 version of the Texas Peace Officer's Crash Report Form (CR-3). Invitations to participate in the survey were distributed to law enforcement offices' via e-mail. The intent was to solicit opinions from law enforcement user groups who report crashes using the TxDOT CR-3 reporting form. A total of 223 responses to the survey were received and evaluated.

In addition to conducting the survey, TTI and the Texas Department of Transportation (TxDOT) held a series of state wide CR-3 user forums in August of 2010. These forums were conducted in the cities of Corpus Christi, Houston, Tyler, El Paso, Amarillo, Austin and Arlington in order to solicit feedback from as many law enforcement agencies as possible that use the CR-3 crash report form on a regular basis.

The survey results, as well as comments and feedback from officers who attended the statewide forums, identified mutual dissatisfaction with using the (01-10) CR-3 form. Law enforcement users expressed several frustrations that were being experienced with using the (01-10) CR-3 crash report form in the field. Comments on the transformation of the reporting process and subsequent coding required for completing the (01-10) CR-3 form were reported as making the investigative process more complicated. As a result of problems being encountered with coding that is required throughout the (01-10) CR-3 form, users were reporting confusion, frustration and apathy toward completing the crash report.

The most frequent reported user frustration was the required use of numbered codes for what was once script written responses placed into data fields. Respondents indicated that the codes required for many of the (01-10) CR-3 form's data fields were not intuitive making completing the form unnecessarily complicated and time consuming. Additionally, respondents shared their concern that the form is not easy for the general public to understand without assistance.

Law enforcement users also stated that the (01-10) CR-3 form is too long, too compressed, and ask what they believed was too many unnecessary questions. Font sizes on the (01-10) CR-3 form and the space available to script answers for each of the fields was reported to be very small which increased the difficulty of completing the form by hand. This was a common frustration since the majority of the (01-10) CR-3 form users collect crash data in the field using script writing methods.

Finally, difficulty with finding and entering codes correctly into required and non-required fields resulted in a high rate of error which consequently resulted in a large number of (01-10) CR-3 reports being returned to law enforcement agencies for corrections. This resulted in hardships for the reporting law enforcement agencies clerical staff, especially in situations when the (01-10) CR-3 in question was in need of multiple corrections.

While the first survey and the forums suggested a high level of frustration among many of the respondents, not all the feedback about the (01-10) CR-3 was negative. Officers who used one of the

electronic formats (the TxDOT-supplied Excel spreadsheet and/or one of the third-party software packages) to complete the form liked the convenience of drop-down menus and single-keystroke features. Several more users at the statewide reporting forums also commented that they were getting proficient in the use of the (01-10) CR-3 form and preferred not to return to the old form or for TxDOT to develop a new one.

Second CR-3 Survey

While the initial survey and the statewide forums provided TxDOT with a "snapshot" of end user experiences with the (01-10) CR-3 report, TxDOT sought to obtain additional feedback from as many of the state's law enforcement administrators as possible. The purpose of this administrative feedback was to learn and better understand the concerns that high ranking administrators with law enforcement agencies were experiencing as a result of changes that were made to the (01-10) CR-3 crash report form.

TTI was asked to conduct a second survey in September of 2010. The online survey became active on September 21 and remained open for responses through October 1. Certified letters were sent to each of Texas' 1,801 police chiefs, sheriffs, and constables requesting their participation. Of the 1,801 surveys distributed, 31 were returned as undeliverable. An instructional letter requested the recipient to complete the survey located on the Survey Monkey site. Both the letter and the introductory page of the online survey explained that only one survey response per agency would be counted in the results.

There were thirteen multiple choice survey questions that were posed. The first three questions established the size of the responding agency and the number of crashes that the agency typically reports each month. The remaining questions addressed the issue of relevance regarding the requested data collected on the form; the forms structure and ease of use; the responding agency's preference for keeping the current form as is, returning to the previous version of the (03-09) CR-3 crash report, modifying the (01-10) CR-3, or developing a new crash report form.

Responding Agency Statistics

A total of 469 agencies responded to the survey. Twenty-four respondents (mostly constable agencies) indicated that none of their personnel respond to or report vehicle crashes. These responses were stratified from the rest of the sample and are not included in the results of this report. Table 1 lists the numbers of crashes reported per month by the responding agencies.

Table 1. Numbers of crashes worked per month by responding agencies.

Number of Crashes Worked Per Month	Number of Responding Agencies	Percentage of Responding Agencies
5 or less	165	37%
6-10	73	16%
11-20	59	13%
21-30	44	10%
31-60	41	9%
61-100	25	6%
100+	38	9%

Results from the first survey and the forums indicated that the larger law enforcement agencies in the state may adjust more rapidly to using the (01-10) CR-3. This may be due to the higher frequency of crashes investigated by the larger agencies giving them increased exposure to the form (e.g. more practice). The larger agencies also were more likely use third party software to complete the form. Due to these factors along with the need for agencies to retrain officers based on the revised form, it is reasonable to presuppose that the larger agencies responding to the survey would be more likely to recommend keeping the (01-10) CR-3 form.

Survey responses that were received from the larger agencies were compared to the overall responses. The 38 responding agencies who report more than 100 crashes per month were analyzed separately to identify any potential difference between agencies based on the frequency of crash reporting. Since the group of agencies is so diverse, TTI requested data from TxDOT regarding the agencies who report the largest numbers of vehicle crashes to the State. TxDOT identified nine law enforcement agencies that collectively accounted for over half of all crash reports submitted in 2009. Of those agencies, eight representing 49.8% of all 2009 crash reports responded to the survey.

Even though the larger agencies report more total crashes per month than the smaller agencies, the average number of reports per officer remained relatively small regardless of the size of the agency. The number of total reports submitted by the eight large agencies ranged from 9,429 to 67,111, but due to the number of officers in each agency that report crashes as part of their job duties, the per officer average ranged from 1.6 to 2.3 crash reports per month. A sample of the smaller agencies indicated that the per-officer reporting average was equivalent to those found in the larger agencies as well. This finding provides some insight into why agency opinions concerning reporting frustrations are similar.

Questions Rating the 2010 CR-3

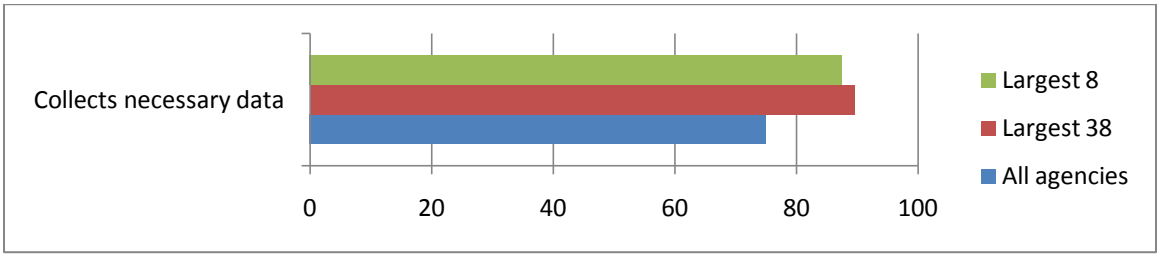
A series of questions addressed the (01-10) CR-3's ease of use and suitability for collecting the needed information regarding vehicle crashes. Because coding was the most frequently mentioned concern of respondents, several of the questions addressed existing and potential "tools" for aiding users with the

form's coding system. Each question was posed as a statement, followed by a five-point scale response for the respondents to indicate how much they agreed or disagreed.

The current CR-3 crash report collects the necessary data related to the crash.

Three hundred thirty three respondents (75%) agreed that the (01-10) CR-3 form was designed to collect the necessary information about a vehicle crash. This indicates that the form users understand the importance of the data they are collecting indicating that the crash data being collected was needed and necessary. This percentage increases among the larger agencies as can be observed on Figure 1.

Figure 1. Percent of responses agreeing with statement: CR-3 collects necessary data.



The current CR-3 crash report is structured well, is easy for the officer the use, and allows the data to be recorded accurately.

Unfortunately, few users were pleased with the collection methods that are presently being used to capture the crash data. Of those users who responded, 72% did not agree with the statement that "the form is structured well". Eighty six (86%) percent did not agree with the statement that the (01-10) CR-3 form was "easy for the officer to use." Fifty two (52%) percent of the users did not agree with the statement that the crash report allows data to be recorded accurately.

While it was clear that the users of the (01-10) CR-3 form have an appreciation for the data being collected, the issue identified as problematic was coding and the use of separate coding documents to determine responses to data fields. Many of the grievances that were expressed from the first survey and the statewide forums centered on the difficulty of recalling or referencing the required data codes while completing the report. Differences among the agencies reporting crash records can be observed in figures 2-4.

Figure 2. Percent of responses agreeing with statement: form is structured well.

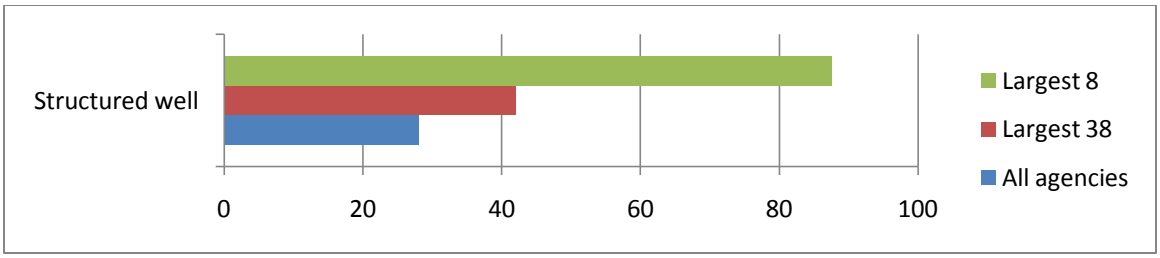


Figure 3. Percent of responses agreeing with statement: easy for officer to use.

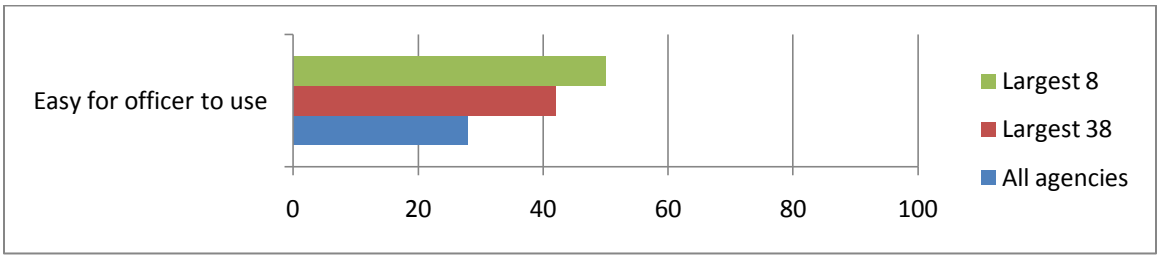
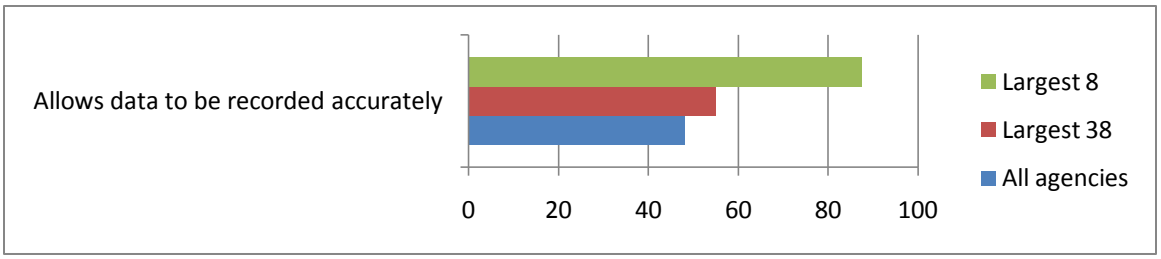


Figure 4. Percent of responses agreeing with statement: allows data to be recorded accurately.

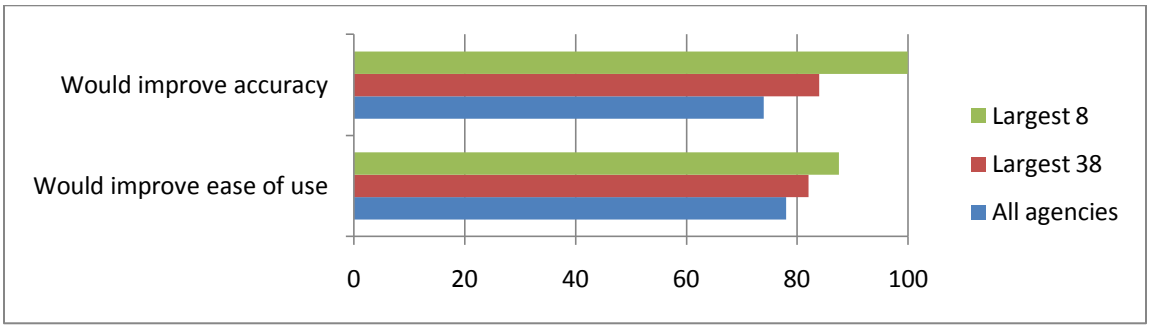


Survey Results for Codes Printed on Crash Report

Two questions addressed a hypothetical alteration that would allow listing some code choices within the body of the (01-10) CR-3 form. When asked if listing the code choices within the report would improve the form's ease of use, 78% of respondents agreed. This response remained relatively consistent when responses were compared against the larger reporting agencies. Eighty-two percent (82%) of the largest 38 agencies and 87.5% of the largest eight agencies agreed that having the codes printed on the form would increase the ease of use.

Additionally, a total of 74% of the respondents agreed that placing the codes on the (01-10) CR-3 report would improve the accuracy of the information being collected. This was also consistent with the responses given by the largest reporting agencies in the state. Eighty-four percent (84%) of the largest 38 agencies and 100% of the largest 8 agencies believed that having the codes on the (01-10) CR-3 form would improve the accuracy of the information being collected. Differences can be observed in Figure 5.

Figure 5. Percent of responses agreeing with statement: inserting codes into form would improve data accuracy/ease of use.



Survey Results for Code Sheets and Clipboards

Ease of use and accuracy of reporting were also examined to assess how respondents view the effectiveness of the two currently available tools: a code sheet listing all the coding information with their definitions and a clipboard printed with the same information. Only 24% of respondents agreed that the code sheet improves the (01-10) CR-3's ease of use and 27% agreed that the code sheet helps improves the accuracy of information entered. Regarding the use of the clipboard as a tool, 35% of respondents agreed that this tool improves ease of use and 34% agreed that it improves the accuracy of information collected.

While there was some difference between the largest eight agencies and the others, overall, the respondents did not appear to believe that the code sheets or the clipboards improve the ease of use or the accuracy of information being reported on the (01-10) CR-3 form. Differences can be observed in figures 6 and 7.

Figure 6. Percent of responses agreeing with statement: code sheet improves ease of use/accuracy of data.

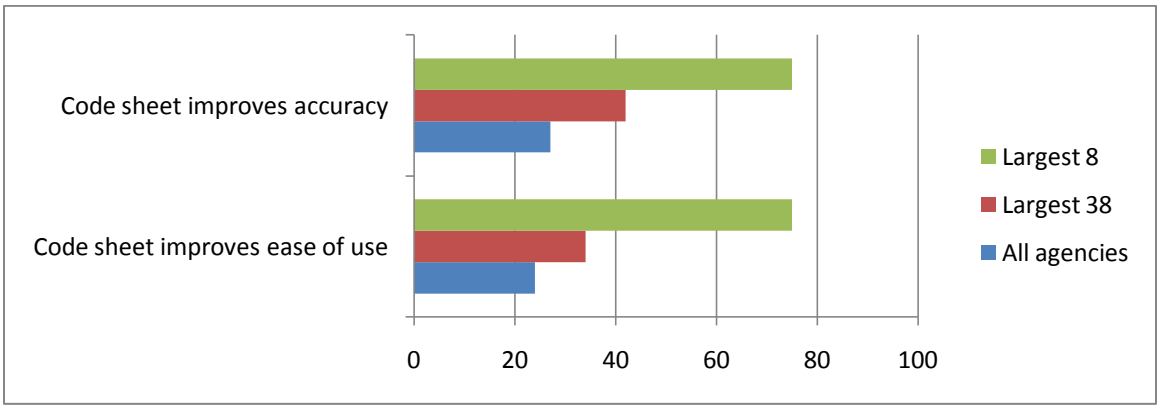
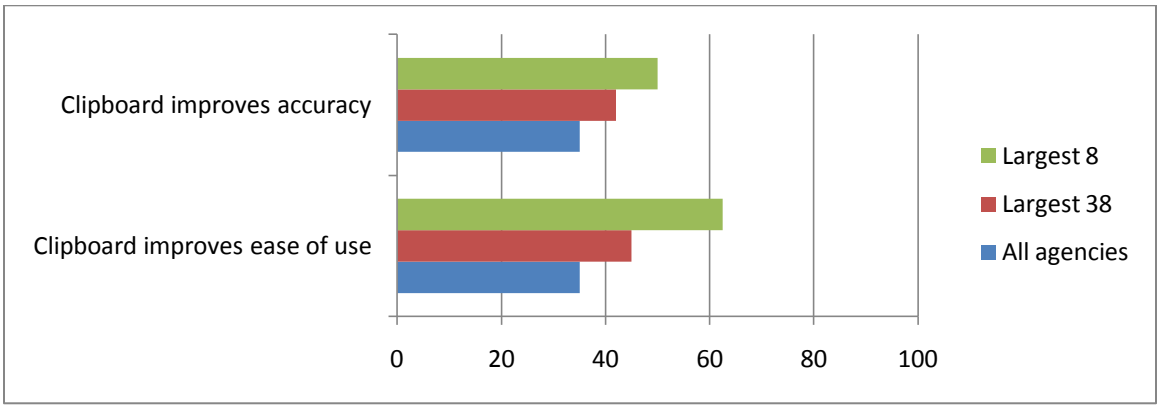


Figure 7. Percent of responses agreeing with statement: clipboard improves ease of use/accuracy of data.

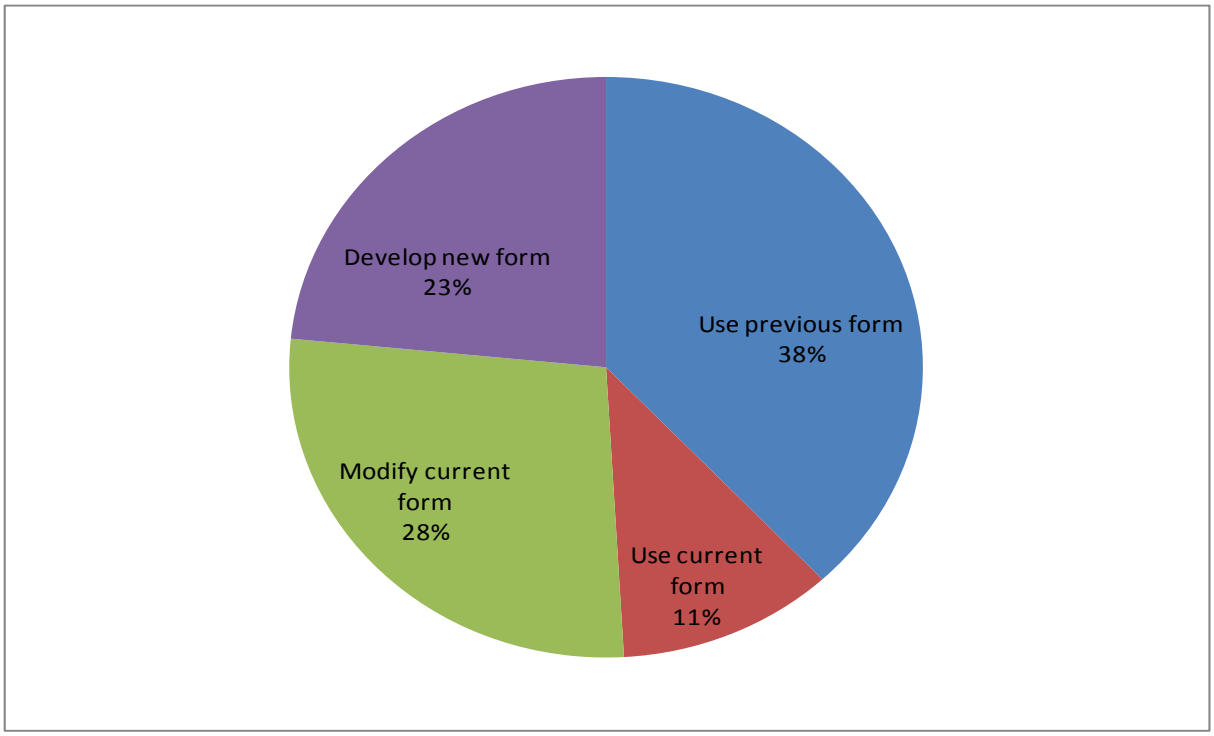


Preferences Regarding Future of CR-3 Form

The final question of the survey asked respondents to select one of four options they would prefer, if given a choice about the format of the (01-10) CR-3 crash reporting form. Choices given were: would you prefer to go back to using the previous version of the (03-09) CR-3; use the current (01-10) CR-3 as is; use the current (01-10) CR-3 with some modifications made to improve ease of use; or have a new crash report form developed.

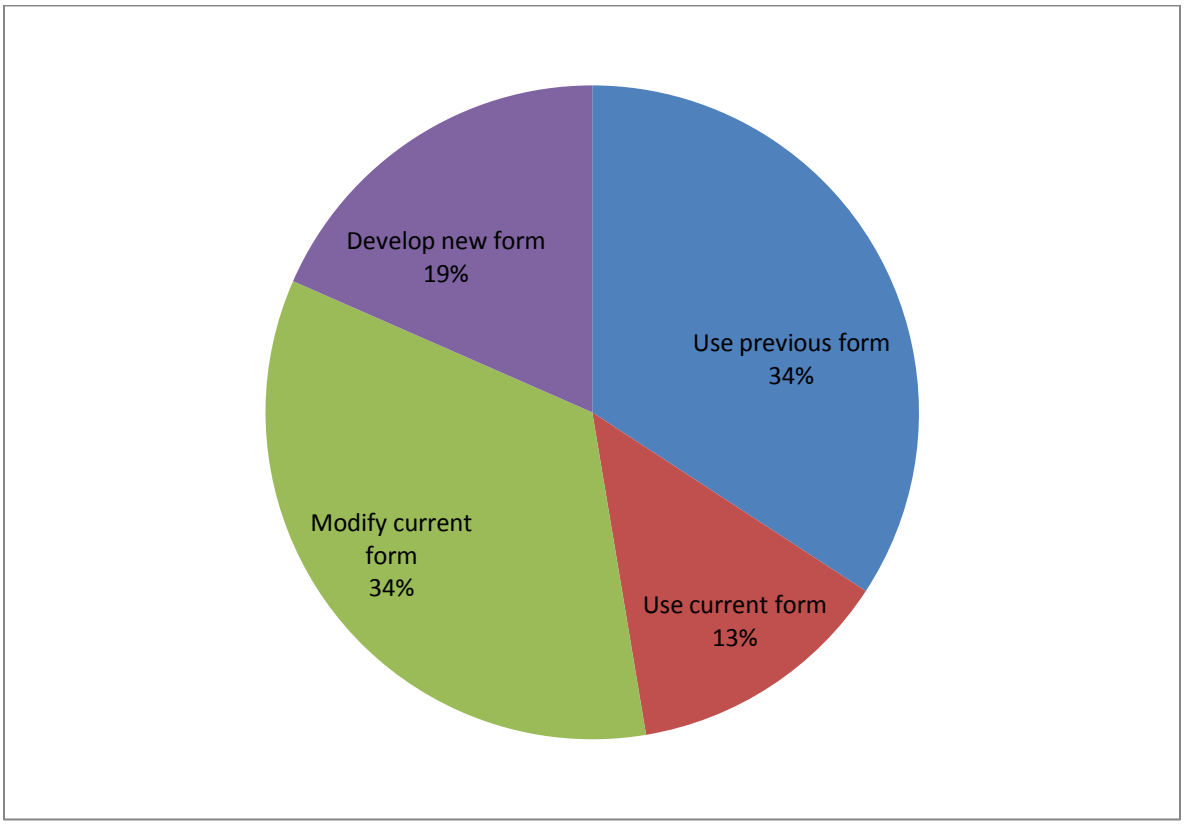
Of the responding agencies, 38% (169 respondents) chose to revert back to using the previous (03-09) CR-3 report form. Eleven percent (11%) (50 respondents) chose to continue the use of the current (01-10) CR-3 form. Twenty-eight percent (28%) (123 respondents) chose to continue to use the current (01-10) CR-3 form with some modifications. Twenty-three percent (23%) (103 respondents) chose to develop a new form. These findings suggest that the (01-10) CR-3 users statewide are divided in their opinions regarding a preference of choice on how to respond to issues they are experiencing with crash reporting. Responses are shown in Figure 8.

Figure 8. Preferences regarding crash report form-all responding agencies.



Information gathered from the first survey and from the statewide forums suggested that the larger law enforcement agencies might be adjusting more rapidly to the use of the current crash report form than smaller agencies. The research team hypothesized that the larger agencies responding to the second survey would be more likely to recommend keeping the current (01-10) CR-3 form. To test this hypothesis, the responses from this group of agencies were examined separately. Figure 9 provides an illustration of the percentage breakdown of the 38 largest agencies that report more than 100 vehicle crashes per month.

Figure 9. Preferences regarding CR-3 - agencies responding to more than 100 crashes per month.

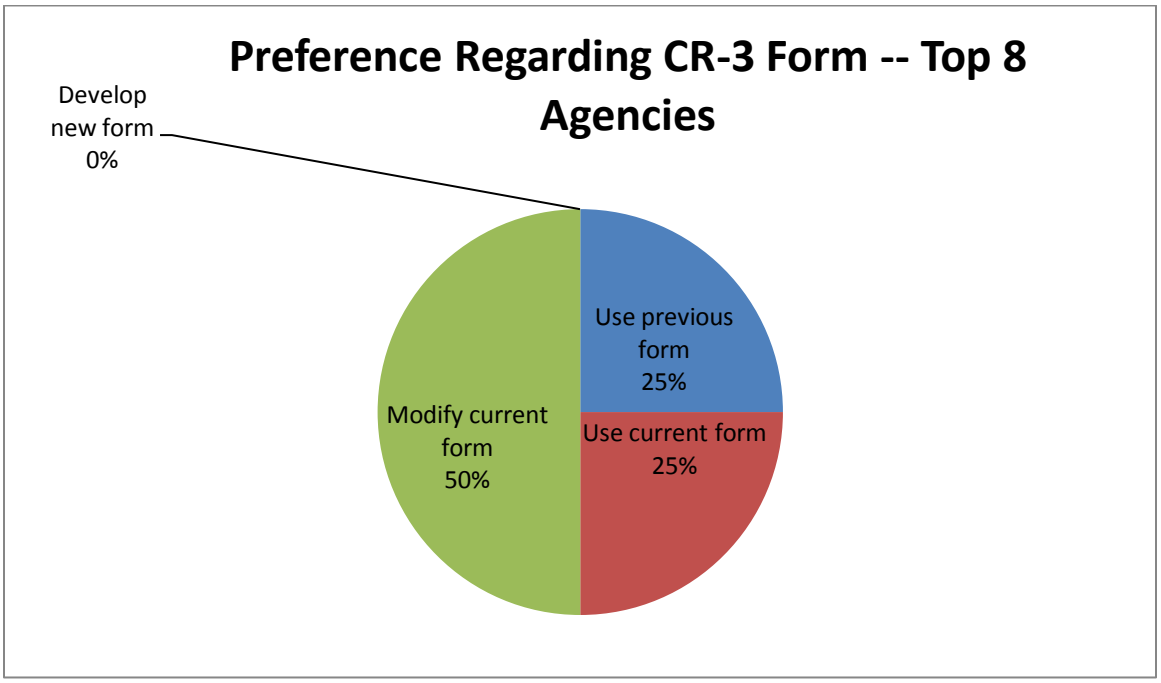


Contrary to expectations, the responses concerning preference of choice on how to respond to issues agencies are experiencing with crash reporting were not significantly different when compared to the overall responses recorded statewide.

Thirty-four percent (34%) (13 respondents) chose to revert back to using the previous version of the (03-09) CR-3 form. Thirteen (13%)percent (5 respondents) chose to continue to use the current (01-10) CR-3 form. Thirty-four percent (34%)(13 respondents) chose to make modifications to the current (01-10) CR-3 form. Nineteen percent (19%)(7 respondents) chose to develop new form. The findings suggest that the 38 larger agencies who report more than 100 crashes per month also appear to be as divided as other agencies around the state regarding which method to choose to address crash reporting issues.

Regarding the choice preferences made by the largest eight agencies responsible for reporting over 50 percent of the statewide crash totals, there was a slight change in opinion. Twenty-five percent (25%) (2 respondents) indicated that they would prefer to return to the previous (3-09) CR-3 form. Twenty- five percent (25%) (2 respondents) chose to use the current (01-10) CR-3 crash report form with no modifications. The remaining 50% (4 respondents) preferred to use a modified version of the current (01-10) CR-3 form. Interestingly, none of the eight largest agencies chose to develop a new form. Figure 10 provides an illustration of the percentage breakdown of the eight largest agencies that report 50% of the vehicle crashes.

Figure 10. Preferences regarding CR-3 – eight agencies responding to 50% of Texas vehicle crashes.



Some differences were seen between the overall survey response and the responses of the larger agencies. Larger agencies reported a more positive view of the form's structure and ease of use. Their opinion concerning the effectiveness of the existing code sheet and clipboard as tools was also better received. However, the larger agencies were still more likely to recommend modifying the current (01-10) CR-3 form as opposed to continuing to use the (01-10) CR-3 form in its current state.

Interestingly, even though the larger agencies file more total crashes per month than do the smaller, the mean numbers of reports per officer remain relatively low when they are compared regardless of the volume of crash reports the agency is producing. As described earlier, it was discovered that officers in each agency who report crashes as part of their regular patrol duties worked an average range of 1.6 to 2.3 crash reports each month. A sampling of the smaller agencies also indicated that this per-officer average applied to many of them as well. This could account for why officers across all agency types are suggesting modifications be made to the current (01-10) CR-3 form.

Examination of Crash Report Forms from Selected States

In an effort to understand the optimal approach to crash reporting, TTI-CTS examined how several other states reported crashes in terms of what and how data is submitted. The crash report forms and procedures from California, Oklahoma, Florida, Virginia and Washington were reviewed and compared to the Texas CR-3 form. The similarities and differences relative to the content and format of the crash reports are summarized in Table 2.

Table 2. Comparison of Crash Report Forms from Selected States

Aspects of the Crash Reports	Texas	California	Oklahoma	Florida	Virginia	Washington
	Similar data is collected by all the states examined. The main difference between the states was not the content of the report, but rather methods by which the law enforcement enters the data or references the required coding.					
Last Revision Date	1/2010	11/2006	1/2007	11/2002	7/2007	7/2006
Primary Report Length	2 Pages	4 Pages	4 Pages	4 Pages (Long Form) 2 Pages (Short Form)	6 Pages	3 Pages
Number of Total Fields on Report	345	317	366	388 (Long Form) 184 (Short Form)	425	332
Range of Factors for Each Field	2-65	4-11	3-98	2-40 (Long Form) 3-26 (Short Form)	2-43	2-44
Approximate # of codes/crash variables	480	44	444	291 (Long Form) 187 (Short Form)	341 (See comments)	289
Differences	N/A	Codes imbedded in report;	Codes imbedded in report at the point of use–no need for separate key;	Options for different forms-*Long Form* & *Short Form*	Bubbles used to record codes that are imbedded in the report ;	No significant differences
Additional Comments	The first two pages of the report contains the required fields while the third and forth pages contain the required codes/descriptions;	Includes space for 3 units (vehicles) on primary report; Use of check boxes for critical data improved ease of use & reporting accuracy;	Supplemental sheets available for additional narratives, diagrams, witness statements, & supplemental people/vehicles	Long Form for severe crashes involving injuries, fatalities and/or impaired drivers; Short Form for property damage only crashes; Necessary codes imbedded in the report at the point of use;	Bubble responses allow for the recording of most critical data including, but not limited to drivers actions, vehicle body type, drinking, type of collision, lighting, work zone information, & area of impact on the vehicles;	Crash form has a separate key sheet similar to the one currently used in Texas;

Table 2 was constructed to provide a quick reference to compare crash reports from the states that were reviewed. For the purposes of this table, fields are the areas where the officer must enter any type of data. The data can be written "fill in the blank", codes, or narrative. The range of factors for each field accounts for those fields where a code must be assigned and entered. In some cases the answer may be yes or no, male or female, etc. while other fields may have extensive choices.

Summary of the Examination of Crash Reports from Selected States

It is interesting to look at the different approached that each of the state took in regards to developing their crash reports. As expected, the six states (Texas, California, Oklahoma, Florida, Virginia, and Washington) collect crash data that was similar in content, but varied considerably in terms of the format of reporting. Texas and Washington were the only two states that utilized a separate code key sheet or code table to assist officers in completing the crash report. Although the remaining states imbedded the codes in the form, each of the states took slightly different approaches to incorporate the necessary information adjacent to the appropriate field. The reports from California and Virginia appeared to be the easiest to complete based on the use of checkbox and bubbling systems. By using this method, officers would not need to know the actual code since it would be located next to the checkbox or bubble. This approach also assists those coding the data into databases or crash reporting systems thereby improving the data input process and subsequent accuracy of the dataset.

The examination of the crash reports from the selected states yielded information that was consistent with the feedback from law enforcement in Texas. In TTI's survey to Law Enforcement, 78% of the agencies that responded agreed that listing the code choices within (imbedded with the fields) the CR-3 Crash Report would improve the form's ease of use. Additionally, the survey respondents (74% of the agencies) agreed that having the codes adjacent or part of the fields would improve accuracy.

TTI recommends that the CR-3 (01/10) crash report be modified to include the code choices within the CR-3 instead of utilizing a separate code sheet or code clipboard. This modification will not change the content of the form (data collected), but it will change the format. If this suggested modification is incorporated, the form is expected to be four pages in length. The current form is two pages, but it is accompanied by the code sheets making the total form four pages. The amount of information collected will be the same with the proposed form. The modification will improve the ease of use for all officers as well as the data input into CRIS. It is expected that the form will improve the efficiency and the effectiveness for all officers regardless of the familiarly with the form or the frequency of use.

Options to Consider: Advantages and Disadvantages

The four options presented to survey respondents in the final survey question each have specific advantages and disadvantages associated with them.

Option 1: Return to the previous CR-3 form. Out of the four options presented, this received the largest choice percentage (38%). The advantages to returning to this form include its familiarity to many law enforcement officers and its relatively simple "fill in the blank" format. Coding information was

noted on the crash report form and officers did not have to consult separate coding sheets or manuals in the field to decipher code responses for the form.

Disadvantages include the resulting need to redesign the upcoming CRASH database and the data uploading procedures. In order to proceed with the plan to promote and accept on-line entry of crash data, the previous (03-09) CR-3 form would need modification as well. Although this choice received the largest percentage of choice in the four options, it still did not represent a majority of the officers surveyed. Sixty-two percent (62%)of responding agencies were not in favor of returning to the previous version of the (03-09) CR-3.

Option 2: Continue using 2010 CR-3 form as is. This was the least popular choice among the responding agencies receiving only 11 percent of the total response. While a majority of the officers across the state indicated their displeasure with continuing to use this form, the current (01-10) CR-3 form has some advantages. The current (01-10) CR-3 form allows TxDOT to continue forward progress toward implementing web-based CRASH reporting. There has been a substantial amount of time, effort and funding dedicated to the creation of this form and reporting procedure that should not be discounted. Redevelopment of a new form and modification of the current form will require additional human and financial capital to recreate what is already an approved method of data collection. In addition continuing to use the current (01-10) CR-3 form allows law enforcement agencies who have invested in third-party software programs to continue the use of their network infrastructure without having to pay for changes or updates. Finally, the current (01-10) CR-3 report form was designed, developed and approved by TxDOT, the Texas Department of Public Safety (DPS), and the law enforcement working group to capture the crash data that those participants felt was necessary. To ignore these efforts could do irreparable harm to relationships that have been built between those who participated in the working group, DPS and TxDOT.

The disadvantages of continuing with the current form include widespread dissatisfaction with the form's usability and the resulting high error and return rate. The current (01-10) CR-3 form in its current format is not conducive to easy completion. Those user agencies that do not use an online/electronic reporting protocol and do not expect to transition to an online/electronic system in the near future, will continue to experience frustration, data entry errors, and reporting delays.

Option 3: Modify the current form. This was the second most popular option among responding agencies, with 28% selecting it as their choice preference. Modification of the current report form would focus on improving ease of use for law enforcement officers in the field. Modifying the format of the current form would most probably strike a balance between the original working group's recommendations and the document's intent, while still allowing for adjustment for some of the areas identified for improvement. This option allows continued progress toward the goal of automated CRASH reporting, with less delay and lower costs.

Disadvantages include a likely need for changes to third-party software used by law enforcement agencies, a delay in the implementation of web-based CRASH reporting compared to the planned schedule, and the costs involved in designing, testing, and implementing the changes. This option may

also be unsatisfactory to the 38% of responding agencies who are unhappy with the current (01-10) CR-3 and wish to return to the old form.

Option 4: Develop a new crash report form. Twenty-three percent (23%) of respondents selected this option. The main advantage of developing a new report form is that the development would not be hindered by pre-existing outlines and formats; new ideas could be developed, and usability would be a primary objective.

However, this would likely be the most expensive and time-consuming option, substantially delaying the implementation of the web-based CRASH system. During the development of the crash report form, officers would still have to utilize the current (01-10) CR-3 form and continue to experience the frustrations listed earlier in this report. Additionally, law enforcement agencies that use third-party software to complete the current (01-10) CR-3 crash report would have to pay for new or significantly modified software packages at a significant cost to the agencies in terms of developmental and training costs. This option could also lead to dissatisfaction among the agencies and officers who were involved in the (01-10) CR-3 crash report working group.

Recommendations

The four options presented above could each be considered for implementation independently. However, a combined approach may be the best way to serve the differing needs of Texas law enforcement agencies. Based on the feedback received from law enforcement officers through both surveys and the forums, the research team recommends the following approach:

Develop a modified version of the (01-10) CR-3 form that is designed for officers who will be completing the form in writing and submitting the hand-written version to TxDOT. Since coding is the primary concern of (01-10) CR-3 users across the state and is the primary reason why crash reports are being returned for error correction, TTI recommends that the modification be made to the form to add in common code examples. This allows the (01-10) CR-3 user to see, list or choose exactly what is needed in specific data field areas. While TTI does not recommend placing every code onto the (01-10) CR-3 crash report itself, common abbreviations, codes and factors may be considered for inclusion. Since ease of use and structure of the form is a pivotal issue with the users, the opinions expressed appear to be in line with this type of minimal change. A majority of the users statewide have expressed a desire to have coded choice options imbedded in the form to provide some direction as opposed to having to turn to the CR-100 instruction manual or to a separate code sheet/clip board. Other recommendations would be:

- Modify the report form so that certain sections or information can be recorded on a separate supplemental page (e.g., commercial vehicle, pedestrian/bicycle) to allow more room for the fields pertaining to more common vehicle-vehicle crashes. These fields can then be expanded to allow more room for written information.

- Modify the form so that users can write the necessary information in each field with as few coded responses as possible. Third-party data transcribers who are currently reviewing and entering hard-copy forms should be able to translate the information into codes at that time.
- The design of the modified form should be reviewed by selected TxDOT and DPS personnel that are actively involved in the development of the CR-3 crash reporting process.
- The modified CR-3 crash report form should be reviewed by a representative group of selected law enforcement officers for comment/feedback so the form may be revised as needed before it is sent to the Texas Transportation Commission for approval.

TTI recommends that the Excel and Adobe PDF versions of the CR-3 (1-10) form remain unchanged, so that users who are already completing this version of the form electronically can continue doing so. Since the electronic versions of the current CR-3 (1-10) form are self correcting and allow for coding choices to be made by selecting options from drop down boxes, the rate of error from officers are minimal. This option also allows TxDOT the freedom to continue moving forward with automated crash reporting via electronic or web-based delivery system protocols.

TTI also recommends that the current (01-10) CR-3 crash report continue to be used by those agencies that choose to do so. This ensures that agencies who have invested in third party software packages can continue to use their systems without adversely impacting their crash reporting responsibility. In addition, many agencies have invested time, effort and financial resources into training their personnel in the use of the (01-10) CR-3 form. By allowing agencies to continue crash reporting using the (01-10) CR-3 form, crash data collection efforts will be less likely to be influenced negatively for those agencies choosing this option.

TTI researchers understand that there are a wide variety of people who use the data that is collected on the (01-10) CR-3 report. It is also understood that the quality of data that is collected is critical to traffic safety programs that are driven by the information. However, there must be a balance between those who use the data and those who are responsible for collecting it in the field. The (01-10) CR-3 form should be designed so that it is clear enough to use for decision-making, but also flexible enough to adapt to and easily use in the field. Clearly, there will never be a product that will make every user happy, because in the end, that product is suitable for no one. However, TTI researchers can address the issues on the (01-10) CR-3 form that are causing frustration for users and collectors. By addressing the issues identified as problematic and being flexible enough to accommodate and adapt to the necessary changes, barriers can be overcome and data collection efficiency may become more standardized and reliable.